

2013 Maryland FMP Report (July 2014)

Section 22. Yellow Perch (*Perca flavescens*)

Maryland FMP

Maryland's yellow perch fishery is evidence that some fisheries may be locally important despite their small size. The fishery is characterized by excellent recreational fishing and a conservatively controlled limited commercial harvest. The Maryland Tidewater Yellow Perch Fishery Management Plan (YPFMP), adopted in 2002, improved on the traditional fishery management plan (FMP) format by including guidelines for ecosystem-based management. Ecosystem based surveys utilizing yellow perch data have been important in developing guidelines for habitat preservation and land use decisions.¹ Stakeholder meetings were conducted during 2008 to develop objectives for the commercial and recreational fisheries. Maryland's yellow perch fisheries have responded to management actions taken in 2009. The YPFMP was adopted in 2002 and reviewed in 2006 and 2013. The 2013 FMP review recommended an amendment to address new management strategies.

Stock Status

Yellow perch stocks are not overfished and overfishing is not occurring.¹ Yellow perch stock assessments have been conducted every two years up to 2005 and annually since 2007 for the upper Chesapeake Bay. The biological reference points (targets and thresholds) were updated using a spawning stock biomass per recruit model. The yellow perch assessment model was refined by adding three more years of data (2011-2013), re-examining fishery independent indices and weightings, and expanding the range of ages.² The revised Upper Bay population estimate has varied from 714,000 in 2011 to 632,000 yellow perch in 2012 to 887,000 in 2013 (Figure 1). A biomass estimate of 321,000 pounds was calculated for 2013. Recruitment to the population at age 2 has increased from an estimated 207,000 in 2011 to 234,000 in 2012.² Total instantaneous fishing mortality ($F=0.23$) remains under the target F of 0.53. Both abundance (Figure 1) and biomass (Figure 2) estimates increased in 2013 while estimated fishing mortality decreased (Figure 3). Estimated recruitment in 2013 was just above the long-term average (Figure 4).

Current Management Measures

After considerable public input during 2008, yellow perch fisheries are managed under a Total Allowable Catch (TAC). The TAC has been allocated 50:50 between the commercial fishery and the recreational fishery since 2009. The TAC is calculated annually based upon the stock assessment to achieve the target fishing mortality rate ($F=0.53$). The fishing mortality target is divided in half between the commercial and recreational fishing sectors. Fishing mortality for the commercial fishery in 2013 was calculated at 0.23, a minimal decrease from 0.28 in 2012 (Figure 3). Three management areas have been established: the Upper Bay, the Chester River

and the Patuxent River. A management area's commercial season is closed early if the TAC is reached before the scheduled closing date. Any overages are subtracted from the following year's allocation. Commercial fishermen are required to have a special yellow perch permit. Daily reporting is required in the commercial fishery and every fish is tagged for accountability. The commercial fishery has a slot limit of 8.5 to 11 inches. There are areas closed to commercial fishing. The recreational fishery is open year round, has no closed areas, a minimum size limit of 9 inches, and a creel limit of 10.

The Fisheries

The commercial quota has not been reached for the last three years. Final quotas for 2012 were 38,950 pounds for the Upper Bay; 6,770 pounds for the Chester River; and 2,500 pounds for the Patuxent River. The Upper Bay harvest was under its quota by 1,757 pounds; while the remaining quota for the Chester and Patuxent Rivers were 1,252 and 1,213 pounds respectively. The 2012 season was the first season in which the quotas were not reached or exceeded for any management region (Figure 5).

In 2013, the yellow perch season was extended from March 10 to March 16 for the Upper Bay and Patuxent River management units. The quotas of 29,800 pounds for the Upper Bay; 5,175 pounds for the Chester River; and 2500 pounds for the Patuxent River were not met. The TAC was not reached for any management unit (Figure 6). Overall harvest was 32% under the quota in 2013.

In 2014, the yellow perch season was extended from March 10 to March 20 for the Upper Bay and Patuxent River management units. The quotas of 27,200 pounds for the Upper Bay and 4,725 pounds for the Chester River were the lowest quotas since 2009. Overall harvest was 27% under the quota in 2014 (Figure 7).

Issues and Concerns

Scoping of a new commercial season closing date of April 1 is expected. Discussions continue for electronic reporting and a new hail-in system that may eliminate the need for laborious tagging while maintaining accountability.

Some areas, such as the Severn River, continue to experience poor egg survivorship³.

Recreational harvest is unknown. It is believed to be within the recreational TAC, but estimates are unavailable.

References:

¹ Uphoff, J.H., M. McGinty, R. Lukacovic, J. Mowrer and B. Pyle. 2009. Impervious surface target and reference points for Chesapeake Bay subestuaries based on summer dissolved oxygen and fish distribution. Fisheries Technical Report Series Number 55. Maryland Department of Natural Resources, Annapolis, MD 21401.

² Piavis, P.G. and E. Webb, III. 2014. Population assessment of yellow perch with special emphasis on head-of-Bay stocks. In Chesapeake Bay Finfish and Habitat Investigations. Maryland Department of Natural Resources, Federal Aid Annual Report, F-61-R-9. Annapolis, Maryland.

³ Blazer, V., A. Pinkney, J. Jenkins, L. Iwanowicz, S. Minkinen, R. Draugelis-Dale, and J. Uphoff. 2013. Reproductive health of yellow perch *Perca flavescens* in selected tributaries of the Chesapeake Bay. Science of the Total Environment. 447:198-209.

Figure 1. Yellow perch population abundance estimates from the Upper Bay, 1998-2013.²

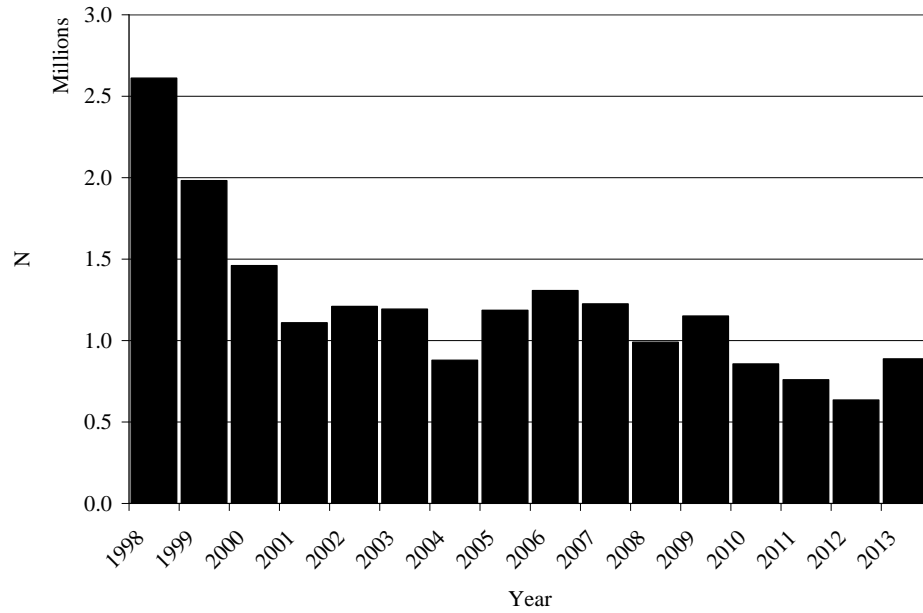


Figure 2. Estimated biomass of Upper Chesapeake Bay yellow perch, 1998-2013.²

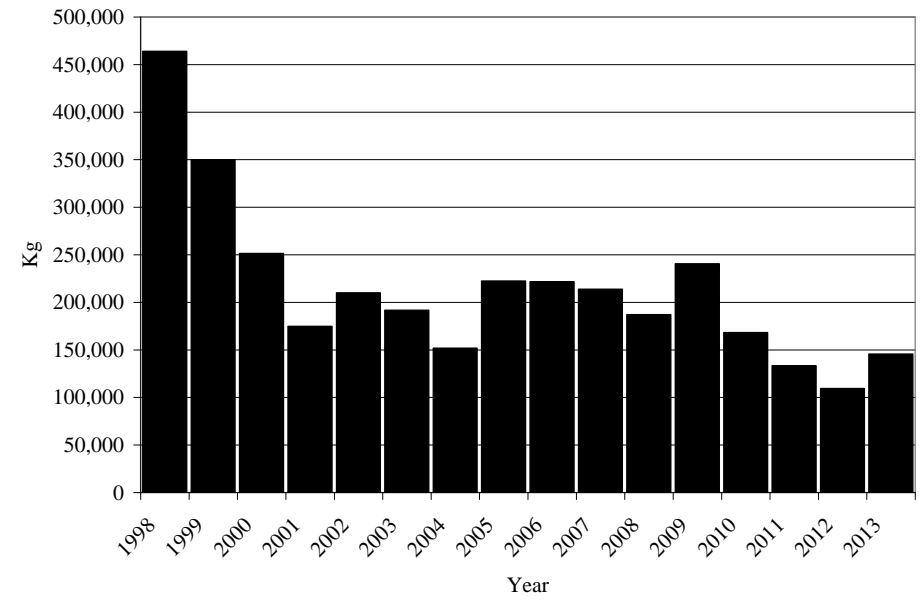


Figure 3. Instantaneous fishing mortality (F) estimates for Upper Chesapeake Bay yellow perch, 1998-2013.²

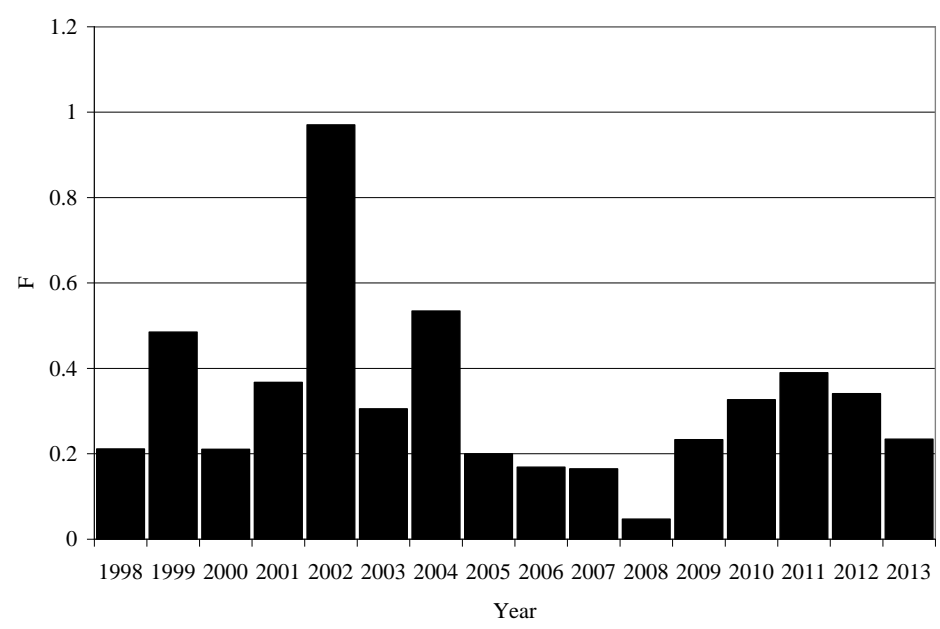


Figure 4. Yellow Perch recruitment estimates for Upper Chesapeake Bay, 1998-2013 with long-term average line.²

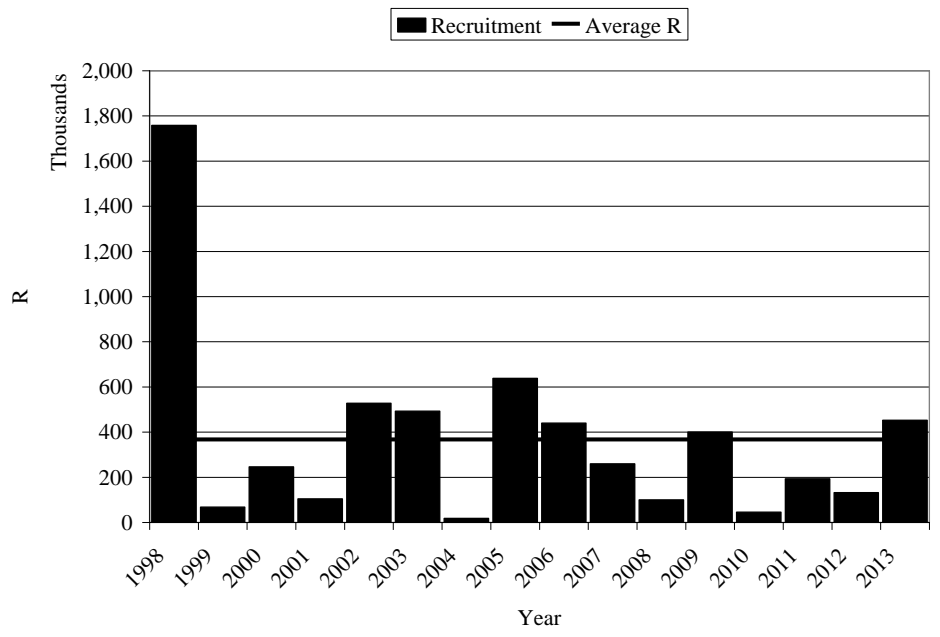


Figure 5. Maryland commercial yellow perch harvest by region, 2012

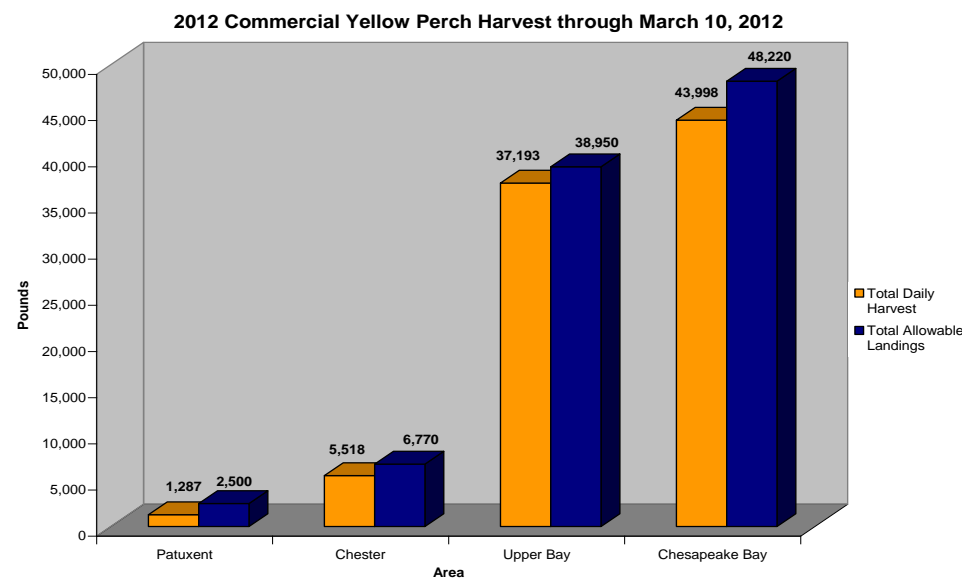


Figure 6. Maryland commercial yellow perch harvest by region, 2013

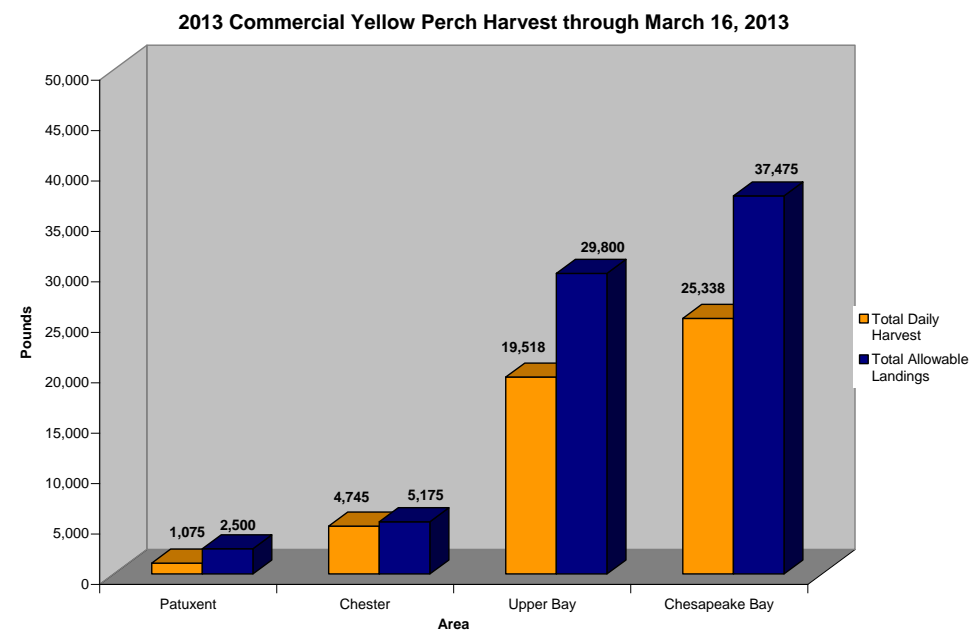
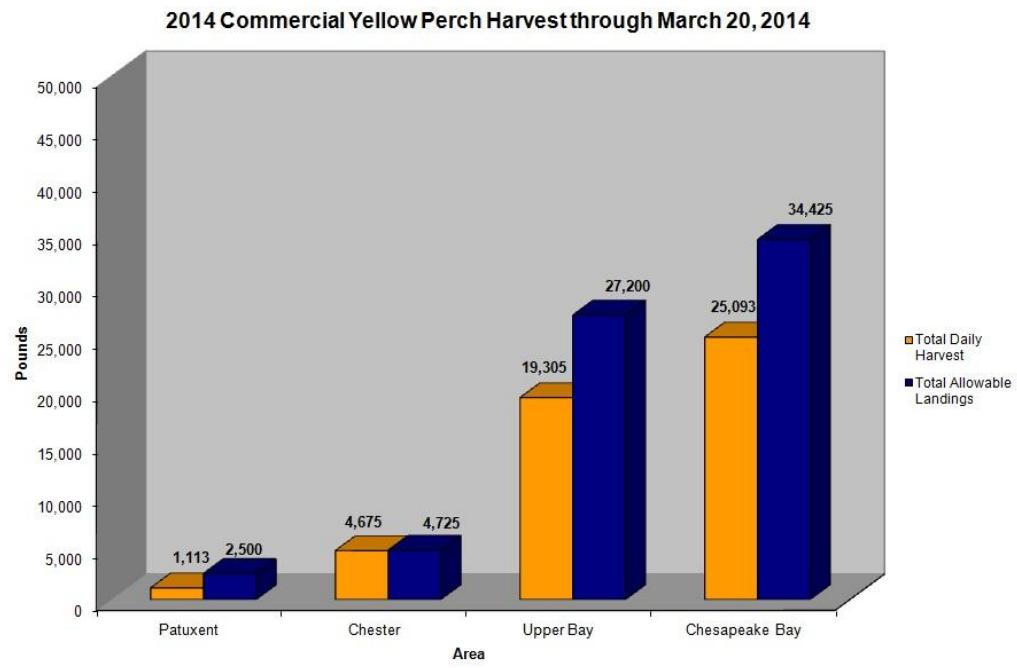


Figure 7. Maryland Commercial Yellow Perch Harvest by Region, 2014



2002 Maryland Tidewater Yellow Perch Fishery Management Plan Implementation Table (updated 07/10/14)

Section	Action	Date	Comments
Implement Ecosystem Considerations	1) Adopt the following ecosystem guidelines	2001	Refer to comments for each sub-action.
	1.1) Participate in forums, which develop federal or state water quality criteria.	Ongoing	Refer to Appendix 1-1 for Chesapeake Bay Program (CBP) efforts. Groups addressing tributary strategies and prioritizing watersheds activities have been made aware of yellow perch. Yellow perch is a focal species for the Corsica River Targeted Watershed project.
	1.2) Cooperate with the MD Department of Natural Resource's (DNR) Chesapeake and Coastal Watershed Services in the development of watershed assessment surveys, watershed restoration plans and in the implementation of restoration and enhancement projects	Ongoing	Watershed & tributary groups use the Anadromous and Estuarine Finfish Spawning Locations in Maryland, Technical Rept. # 42 (Mowrer & McGinty 2002) during discussions of strategies and actions. To date, 25 watershed restoration action strategies (WRAS) have been developed. Each WRAS includes a watershed characterization report, a synoptic survey (water quality & biological) and a stream corridor assessment. Fisheries staff has been involved in reviewing proposals. Funding for developing additional WRAS ended in 2006. DNR, OOS developed the GIS based "blue infrastructure" to identify and prioritizes tidal aquatic habitat and connected watershed features. Yellow perch habitat has been included.
	1.3) Participate in the review of permits for projects, which have the potential for significant impact on fishery resources.	Ongoing	Coordinate with DNR Environmental Review Unit (ERU). The ERU typically reviews 2,500 to 3,000 projects per year. During FY'06 over 800 projects were considered for yellow perch impacts. The ERU has been restructured to include representatives from the major units with DNR. This new structure should aid in improving coordination on restoration and protection projects. As a result of the 2008 Fisheries Task Force recommendations, ERU includes FS staff and fisheries issues are considered in the process. Efforts to improve the ER process has continued.
	1.4) Cooperate with the CBP and the Atlantic States Marine Fisheries Commission (ASMFC) to develop models, collect and exchange data, and support research projects that explore multispecies management.	Ongoing	DNR has provided fishery data for the input parameters of the CBP Ecopath/EcoSim modeling efforts. To date, most of the multispecies initiatives have been focused on migratory species. Yellow perch has not been included in any modeling scenarios but has been recognized as a priority species from a tributary/watershed perspective. Fisheries Ecosystem Project has developed a model of Head-of-Bay yellow perch biomass dynamics that incorporates predation and nutrient management impacts. A cooperative DNR-NMFS CBP effort to develop a Head-of-Bay Ecopath/Ecosim model was initiated for the Yellow Perch Workgroup, but was discontinued.
	1.5) Develop funding sources for habitat restoration.		No new yellow perch habitat projects have been funded. Corsica River Project has provided some info on watershed management in relationship to yellow perch.
	1.6) Develop research proposals to examine habitat fish linkages.	Ongoing	Impervious surface and its impact on aquatic resources (especially fish) are currently under study. There appears to be a 10% IS threshold for fish that also relates to other habitat parameters. Letters of endorsement were supplied for proposals researching habitat and development.
	2) Initiate a Severn River Ecosystem study that focuses on life history stage analysis to assess the effects of	2001 2005	DNR completed field work in 2005. The field results indicated low juvenile survival, low DO and high salinity. Volunteers have been enlisted to monitor yellow perch larvae in the Severn River. These data are incorporated into impervious surface analyses. Severn River habitat has

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	degraded habitat on stock abundance.		been monitored by the Riverkeeper program (http://www.severnriverkeeper.org)
	3) Use the Yellow Perch FMP as a model for the application of ecosystem-based fishery management principles and develop new methods of application/implementation.	Ongoing	The Corsica River Project and Mattawoman Watershed Agreement both use the “best management practice” approach. They include a diverse partnership and strive to minimize development as much as possible. Although Smart Growth is charged with minimizing development, it only addresses infrastructure. Fisheries staff continues to work with citizens and county government on the importance of aquatic health and use the Severn River as an example. It is important to identify prime habitat and aquatic resources and encourage/implement good land management decisions for protection. Impervious surface reference points have been proposed that could directly apply to yellow perch management. Priority habitat areas for fish have been mapped.
Restore Yellow Perch Habitat and Enhance Yellow Perch Populations	4) Use the table on Stock Status and Exploitation and the watershed planning process, to designate yellow perch areas for restoration, maintenance or enhancement and develop specific habitat strategies for each area.	Ongoing	The table was updated but a more general watershed management approach is necessary. There should be an emphasis on preserving habitat especially in more pristine areas. Blue infrastructure may aid in determining priority areas for preservation and restoration. The Fish Passage Program continues to collect ichthyoplankton in some historical yellow perch spawning streams. Results are compared with historical yellow perch ichthyoplankton data.
	5) Designate the currently closed rivers as yellow perch areas of particular concern, so if resources and funding become available, they can be directed to these areas.	2002	Before 2009, the Magothy, Nanticoke, Patapsco, Severn, South and West Rivers were identified as yellow perch spawning areas because these areas were already closed to harvest not because they were currently areas of high reproduction. It would be more appropriate to use impervious surface (IS) data and development projections to identify potential habitat areas of particular concern (HAPC). Most of the identified areas above have high IS values and degraded habitat except the Nanticoke. This action needs to be reevaluated. Based on current knowledge, Mattawoman Creek should be designated a HAPC. Blue infrastructure may aid in determining priority areas for preservation and restoration. New management strategies for 2009 opened the previously closed areas to recreational fishing only. Migration of yellow perch from Upper Bay areas into the mid-Western shore rivers is responsible for the yellow perch populations in those areas and removals by recreational fishermen will not reduce recruitment in these rivers.
	6) Form a MD DNR intra- and inter departmental team to implement habitat restoration strategies for yellow perch in prioritized tributaries of the Bay. Coordinate with the Watershed Restoration Action Plans and evaluate five watersheds annually.	2002 Continue	MD FS is working with Tidewater Ecosystem Assessment (TEA) and WRAS to develop habitat recommendations. A Wye Island Yellow Perch Research and Monitoring Coordination Meeting was held in 2003. The meeting resulted in increased participation with state and federal agencies. The USFWS conducts research on contaminants in yellow perch from different tributaries when funding is available. MDE is monitoring PCBs and mercury from fish samples and also evaluating disease. The Corsica River Project has been underway since 2005.

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	7) Identify essential fish habitat (EFH) for utilizing progressively more detailed information.	On-going	Results from the Impervious Surface Project of the Bush River indicate that stream habitat in developed regions is no longer viable, but yellow perch larvae are abundant in the estuary. These results indicate that other spawning locations may be more critical. Maps have been updated to illustrate essential fish habitat at different life stages.
	8) Facilitate the implementation of habitat management and restoration practices identified as important to yellow perch.	On-going	Working with tributary teams and local riverkeepers but the scope of work should be broadened. DNR will continue to coordinate habitat activities.
Control Fishing Mortality by establishing biological reference points (BRPs)	9) Adopt BRPs of $F_{35\%}$ and $F_{25\%}$ as a threshold for the yellow perch resource. As more data becomes available, the BRPs may be changed to reflect the most current status of the resource.	2002 Continue	Continuing analysis indicates current BRPs are appropriate. The Maryland Yellow Perch Stakeholder Committee (YPSC) presented recommendations (2007) to evaluate triggers for yellow perch based on stock biomass or age structure in addition to triggers based on fishing mortality. Triggers were evaluated in 2008. The target fishing mortality rate (F) = 0.53.
that describe the targets and thresholds (limits) for yellow perch stocks.	10) Adopt the decision rules for managing the yellow perch resource based on the target and threshold mortality rates and utilize the decision rules to make recommendations regarding the yellow perch systems currently under assessment.	2002 Continue	Decision rules have been adopted. Based on a target fishing mortality rate ($F=0.53$) a 2014 Chesapeake Bay TAC of 34,425 pounds was calculated. This was a decrease from the 2013 TAC of 37,475 pounds. The calculated 2014 quota for the Upper Bay commercial fishery was 27,200 pounds. The Chester River quota was 4725 pounds and the Patuxent River quota was 2500 pounds. Improved catch reporting included daily call-ins, verified by tagging. These measures were implemented in 2009 to improve accountability and have continued.
	11) Utilize Table 1 of MD Yellow Perch FMP to guide the development of management strategies and actions for selected river systems within the MD portion of the Bay.	On-going Evaluated/ Updated Periodically	Management actions may include size limits, creel limits, closed seasons, area closures, and/or gear restrictions. The table was updated (2006) but needs to be reexamined for its usefulness in guiding management strategies. Starting with the 2009 season, the annual stock assessment will determine the strategies and actions for three management areas – Upper Bay, Chester River, and Patuxent River for commercial fishing. The stock assessment, creel surveys, and public input will help determine strategies and actions for the recreational fishery.
	12) Continue the 8.5 -11 inch slot limit for the commercial fishery in all open areas and adjust fishing mortality (F) depending on the most recent stock assessment.	2000 Assessed annually	Slot limit has not changed and is currently in place. Analysis was conducted and evaluated. Slot limit was selected to be the most robust approach. Fishing mortality was below targets in all years. No changes in management recommendations. During stakeholder meetings in 2008, the slot limit was widely supported.

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	13) Continue the uniform recreational minimum size limit of 9 inches in all open areas. Adjust size and/or creel limits depending on the most recent stock assessment.	2000 Assessed annually	The 9 inch size limit is still in effect. Fishing mortality was below targets in all years. No changes in management recommendations. Based upon recent stock assessments, the creel limit was increased from 5 to 10 yellow perch effective with the 2009 recreational season.

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User Conflicts	14) Establish an ad hoc yellow perch committee comprising stakeholders to provide input into the yellow perch management process.	2001	The ad hoc group will meet as necessary. The Sport Fisheries & Tidal Fisheries Advisory Committees will also consider new recommendations. Ad hoc group was empanelled and met during 2006-2007. No progress was made on reducing conflicts. Stakeholder meetings held in 2008 produced compromises that allow both quality recreational fishing and a limited commercial fishery.
Examine the conflict between commercial and recreational uses of yellow perch. Identify	15) Evaluate the utility of a web-based volunteer angler survey to collect data on the recreational fishery and implement the survey if feasible.	2002	A pilot program to utilize angler logbooks was implemented, but the anglers did not return any information. The program was discontinued. A web-based angler survey was implemented in 2008 and continues. The information provided by anglers in 2012 showed a decrease in the catch per angler hour (CPAH). Shoreline anglers reported the same CPAH as in 2010 and 2011, while boat anglers reported lower catch. Anglers exceeded average reported catches in the Bush, Wye, Northeast, Susquehanna, Patuxent, Chester, and Middle Rivers. The full results can be viewed at: http://dnr2.maryland.gov/Fisheries/Pages/survey/index.aspx
any problems and recommend solutions.	16) MD DNR has implemented a system to track the use of pound nets in the Bay. Evaluate the pound net system. For tracking fyke nets and make recommendations for their use.	2003	Fixed gear restrictions are county specific. DNR has done unofficial counts of fyke nets and over the last few years the number of fyke nets has decreased. The number of nets is recorded on reporting forms but it is difficult to get effort data. Regulations to prohibit the use of fyke nets in tributaries upstream of the first 200 ft. channel width during the month of February were implemented for 2008. The width limit was changed in 2009 to a geographic and temporal restriction by area. Fyke nets were legally defined in 2009.
	17) If fishing mortality is too high in relation to the adopted targets, strategies to reduce fishing effort will be explored. Topics to be considered include but are not limited to: capping the number of fyke nets per fishermen, the placement of fyke nets in river systems (i.e., total number per river system; distance between nets); daily harvest restrictions; and seasonal quotas.	As necessary	When targets have been exceeded, these types of management strategies to reduce fishing effort will be evaluated. Total Allowable Catch (TAC) is calculated based on the latest stock assessment. Allocation of the TAC between commercial fishing and recreational fishing is determined after considering input from stakeholders. The public notice required to close the commercial fishery has been reduced from 48 hours to 24 hours.
	18) Evaluate the need for increased enforcement of yellow perch regulations, develop strategies to meet the needs and implement actions accordingly.	To be determined 2001 Continue	NRP makes a special effort to enforce yellow perch regulations during spring spawning run. They also conduct a yellow perch creel survey based on random stops and interviews, mostly at road crossings.
Stock Status MD DNR will monitor yellow	19) Continue to sample commercial and recreational harvest of yellow perch and collect basic biological data. Additional biological data may indicate changes in the status of the	On-going	Chesapeake Finfish Program (previously FS Multispecies Project) collects yellow perch data from commercial and experimental fyke nets, seine and trawl surveys and uses data to periodically assess stocks. Upper Chesapeake Bay populations decreased in 2011 and 2012 but increased in 2013. Recruitment has been under the long-term mean recruitment for but increased in 2013.

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perch stocks in representative areas of the	stocks and require additional management measures.		
Chesapeake Bay in order to assess yellow perch stock status. Assessment and	20) Develop a method for evaluating yellow perch recruitment and utilize it as one of the parameters for assessing stock status and consequent management actions.	2003	Yellow perch recruitment has been monitored on the Severn River but is no longer a priority. DNR utilizes the EJFS in the upper Bay for information on recruitment. Larval survey methods are being evaluated for use in tributaries. The Nanticoke, Bush, Corsica and Severn rivers were sampled in 2006.
management efforts will be focused on areas already under special management measures, i.e., closed areas.	21) Yellow perch egg strands are easy to collect and important for hatchery and/or aquaculture endeavors. Maryland will prohibit the removal or selling of egg chains that have been stripped by artificial methods, unless a scientific collection permit has been issued.	2001 2005	A person needs a Scientific Collection Permit as described in Natural Resources Article, §08-02.12.02, of the Annotated Code of Maryland, to collect yellow perch eggs. Effective Feb. 2005, a person may not catch or possess yellow perch eggs from any state waters (08.02.05.07F).
	22) Evaluate additional fishery-independent indicators of stock status, such as the trawl survey in the upper Bay.	On going	Implementation of this action is dependent on manpower and funding
	23) Review and evaluate yellow perch monitoring efforts biannually. Recommend changes in monitoring and protocol necessary to implement the yellow perch FMP.	2002 and even years thereafter	Evaluated annually. Added Marshyhope River to fyke net sampling schedule. Contracted with CBL to do a 2008 yellow perch creel survey in Bush River, Mattawoman Creek, Wicomico River (western shore), and Chester River. Additional rivers were surveyed in 2009 – Chester, Bush, Northeast, Patuxent, South, Magothy and 3 tributaries of the Potomac (Mattawoman Ck., Nanjemoy Ck., Wicomico R.). Funding for this creel survey was cut for 2010. DNR Fisheries Service studies fisheries independent and dependent surveys. Fisheries independent efforts include the Upper Bay Winter Bottom Trawl Survey (Sassafras River, Elk River, Upper Bay, Mid Bay, in 2011) and Choptank River Fishery Independent Sampling. Fishery dependent efforts include Upper Chesapeake Bay fyke net surveys (Gunpowder River, Back River and Middle River vicinities) and Nanticoke River fyke and pound net surveys.
Yellow Perch Outreach MD will continue outreach efforts to engage fishing and non-fishing communities in stewardship of the yellow perch	24) Utilize volunteers from the recreational fishing sector, such as the Coastal Conservation Association or watershed community associations, to obtain recreational data in areas not sampled by the MD DNR Multispecies Project. Explore the use of volunteer recreational survey using the web similar to the recreational survey implemented for striped bass.	On-going	Dependent on volunteer recruitment. The volunteer angler survey did not generate any response and was discontinued. A web-based angler survey has been produced and was implemented in 2008. CCA and MSSA will be asked to promote angler participation. The access to the survey and the summary of the 2008-2012 volunteer yellow perch survey can be viewed at: http://dnr2.maryland.gov/Fisheries/Pages/survey/index.aspx

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resource in tributary basins.	25) Add yellow perch egg strand sampling in the early spring to river basins with volunteer monitoring programs to obtain data on yellow perch spawning locations.	On-going	CCA conducts stream walks utilizing citizen volunteers. The information is used to indicate spawning presence, although zero egg sightings does not mean there is no spawning in a particular system. Shifts away from “traditional” spawning locations may be indicative of habitat degradation and subsequent shifts by spawning yellow perch to more suitable spawning habitats.
	26) MD DNR will continue to partner with the Yellow Perch Hatch, Raise and Release Project by providing assistance and advice in the collecting, raising, releasing, and stocking of yellow perch in all facets of the project.	2004	Arlington Echo Outdoor Education Center reported poor viability of Severn River yellow perch eggs preventing such a program. Focus has changed to bluegill and hybrid sunfish as educational tools.
	27) MD DNR Fisheries Outreach will explore new avenues to involve the public in yellow perch projects, such as a new exhibit on identifying yellow perch egg strands and collecting information on their occurrence and distribution: cooperative efforts with the Team program; and volunteer monitoring opportunities.	On-going	Volunteer monitoring has occurred in the Bush, Severn and Corsica to monitor eggs, larvae and juveniles and to assess aquatic health (water quality). Fisheries staff has continued to give presentations to fishing clubs, environmental organizations, etc. upon request.

Acronyms:

ASMFC = Atlantic States Marine Fisheries Commission

BRPs = Biological Reference Points

CBL = Chesapeake Biological Laboratory

CBP = Chesapeake Bay Program

CCA = Coastal Conservation Association

CPAH = Catch Per Angler Hour

DNR = Department of Natural Resources

DO = Dissolved Oxygen

EFH = Essential Fish Habitat

EJFS = Estuarine Juvenile Finfish Survey

ERU = Environmental Review Unit

F = instantaneous fishing mortality

FMP = Fishery Management Plan

FS = Fisheries Service

FY = Fiscal Year

GIS = Geographic Information System

HAPC = Habitat Areas of Particular Concern

IS = Impervious Surface

MDE = Maryland Department of the Environment

MSSA = Maryland Saltwater Sportfishermen’s Association

NMFS = National Marine Fisheries Service

NRP = Natural Resources Police

OOS = Office of Sustainability

PCB = Polychlorinated Biphenyl

TAC = Total Allowable Catch

TEA = Tidewater Ecosystem Assessment

WRAS = Watershed Restoration Action Strategies

YPSC = Yellow Perch Stakeholder Committee